



# Prevalence of musculoskeletal disorders among healthcare professionals: A hospital-based study

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## Abstract

**Introduction:** Musculoskeletal disorders (MSDs) are a significant occupational health concern worldwide, affecting individuals in various professions, including healthcare practitioners. This study aimed to determine the 12-month prevalence of MSDs and identify associated factors among healthcare practitioners in Ouarzazate, in the southeastern region of Morocco.

**Methods:** A cross-sectional study was conducted, collecting data from 120 participants. The Nordic questionnaire was used to identify MSD prevalence and locations.

**Results:** The overall prevalence of MSDs was found to be 89.2%. Lower back pain was the most common reported site of pain, accounting for 63.3% of cases over the past 12 months. Females had a higher prevalence of MSDs (95.0%) compared to males (77.5%) ( $p$ -value = 0.009). Midwives had the highest prevalence (93.8%), followed by physiotherapists (87.5%) and general nurses (84%). Professionals working in the shift work system had a higher prevalence of MSDs (92%).

**Discussion:** This study provides important insights into the prevalence and factors associated with MSDs among healthcare practitioners at the Provincial Hospital Center in Ouarzazate. The results underscore the need for targeted interventions and preventive measures to address the high prevalence of MSDs in this population. Such initiatives can contribute to healthcare professionals' well-being and occupational health, ultimately enhancing patient care quality.

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**Take-home message:** Nearly 9 out of 10 healthcare professionals in Ouarzazate, Morocco, experience musculoskeletal disorders, emphasizing the urgent need for preventive measures and targeted interventions in healthcare settings.

**Keywords:** low back pain; musculoskeletal disorders; nurses; occupational health.

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## INTRODUCTION

This article aims to explore the specific applications of AI in occupational medicine, a branch of healthcare primarily focused on prevention, and its role in mitigating workplace-related injuries and diseases. Musculoskeletal Disorders (MSDs) represent a significant and pervasive issue within the healthcare domain. Healthcare professionals, including nurses, physicians, and allied health workers, are particularly susceptible to MSDs due to the physically demanding nature of their work. Tasks such as patient handling, repetitive motions, and prolonged standing or sitting periods can strain the musculoskeletal system considerably [1]. As a result, healthcare workers often experience joint pain, back injuries, and other related conditions [2-4]. In such situations, healthcare professionals face the challenge of providing care to others while avoiding personal injury during their daily tasks [5].

Musculoskeletal disorders encompass various signs and symptoms affecting various parts of the musculoskeletal system. These disorders can manifest as pain, swelling/redness, stiffness, and weakness/loss of function. They impact muscles, joints, tendons, nerves, and other structures throughout the body [6].

The World Health Organization (WHO) has identified musculoskeletal disorders as the primary cause of disability and limitations in daily life and work-related activities. These disorders can lead to decreased productivity and income loss due to work absences or career-ending accidents [7]. Specific occupational activities are associated with different types of musculoskeletal disorders. Healthcare workers, given the ergonomic risk factors inherent to their professions, are particularly vulnerable to such conditions [1,8,9].

In a cross-sectional study, researchers investigated a cohort of 645 registered nurses from four regions in China. The findings were quite remarkable, as they showed an overall 12-month prevalence rate of MSDs at 84.2%, with the most frequently affected areas being the lower back (73.5%), neck (73.2%), and shoulders (66.2%). To better understand the factors contributing to MSDs in different body parts, the study utilized logistic regression analysis, considering various potential risk factors. Interestingly, this analysis highlighted the significance of individual factors such as the number of hours worked per week, gender, body mass index (BMI), age, and alcohol consumption, all of which were found to substantially impact the likelihood of experiencing MSDs [4].

According to a study conducted in Tunisia in 2021 among a population of midwives, most surveyed midwives were overweight, with an average body mass index (BMI) of  $28.3 \text{ kg/m}^2 + 3.9$ . The average length of work experience as a midwife was  $20.2 + 9.1$  years, with a maximum of 38 years and a minimum of 3 years. During the past 12 months, the prevalence of musculoskeletal disorders affecting the neck and shoulder was 90.7%. Complaints were predominantly located in the neck and shoulder region, reported by 72.7% of the cases, followed by the shoulders at 64.8%. In this study, obesity and a history of musculoskeletal trauma were significantly associated with musculoskeletal disorders affecting the neck and shoulder. However, no socio-professional risk factors were associated with among midwives in the past 12 months [10].

Similarly, Shaikh et al., 2021 [7], conducted a study to examine work-related musculoskeletal disorders among nurses at the Gulf Medical College Hospital and Research Center. The prevalence of work-related musculoskeletal disorders among nursing staff was approximately 40%, with over 50% being at risk of developing these disorders. The musculoskeletal disorders primarily occurred in the lower back (29.0%), ankle (20.0%), shoulders (14.8%), and knees (13.3%).

In the Moroccan context, according to a study conducted by Lghabi et al. [11] at Ibn Rochd University Hospital in Morocco, all of the surveyed healthcare personnel (12 doctors and 8 nurses) experienced spinal pain, 40% reported pain in the shoulder and elbow, and 80% reported pain in the wrists. Most personnel (95%) were over 40 years old, and 40%

primarily worked in a standing position. Additionally, 80% reported significant fatigue and dissatisfaction with their work positions.

Healthcare is a highly context-dependent profession. While existing studies in other countries offer valuable insights into the issue, they may not capture the specific challenges and risk factors that Moroccan healthcare professionals face. In Morocco, the combination of cultural, organizational, and policy factors within the healthcare system can significantly influence the prevalence and impact of musculoskeletal disorders (MSD) among healthcare workers. The challenging physical requirements of the job, combined with insufficient human resources and the stress stemming from the limited availability of medical equipment, specialized tools (lifting equipment), ergonomic assistance, training, and robust safety measures, can significantly influence healthcare workers' susceptibility to MSD [12].

Moroccan public hospitals suffer, in fact, from a series of dysfunctions and shortcomings that have perverse effects on the quality of their practices, activities, and services. These include resource shortages, ineffective resource management, governance challenges, staff demoralization, accessibility issues, and user dissatisfaction [13]. Despite absorbing a significant portion, approximately 70 to 80%, of the health sector's budget, many public hospitals grapple with inadequate infrastructure, including deteriorating technical facilities and buildings [14]. Furthermore, these institutions often operate with insufficient staffing and limited equipment. The shortage of healthcare personnel in the Moroccan healthcare system is evident, and the unequal distribution across regions exacerbates the issue. In 2012, the World Health Organization identified Morocco as one of the 57 countries facing a chronic deficit of medical staff [15]. This crisis often forces professionals into tasks outside their usual job scope. For instance, due to a shortage of orderlies, doctors may be required to personally transport patients to examination rooms. Frequently criticized and sometimes regarded as unavoidable, this situation is consistently mentioned as a symptom of the crisis affecting all professions [15]. This shortage can lead to heightened pressure on existing staff, resulting in increased stress levels and a greater susceptibility to Musculoskeletal Disorders (MSDs).

Furthermore, previous literature indicated that the progress in ergonomics in Industrially Advanced Countries (IACs) over the last decades is praiseworthy. Yet, it also highlights the significant lack of ergonomics in areas known as industrialized developing countries (IDCs). This deficiency is also noticeable within the healthcare industry [16].

Measuring the prevalence of MSD among healthcare professionals working in such particular conditions of a developing country as Morocco is essential. This study stands out by focusing on the Moroccan healthcare context, aiming to offer insights that address the unique challenges healthcare workers face in Morocco. Accordingly, this study aims to determine the 12-month prevalence of musculoskeletal disorders and identify the factors associated with these disorders among health practitioners at the provincial hospital center of Ouarzazate.

## **METHODS**

### ***Study design***

This cross-sectional quantitative study determined the prevalence and factors associated with musculoskeletal disorders among nursing staff at the Provincial Hospital Center in Ouarzazate. This study took place in the various departments of the Provincial Hospital Center in Ouarzazate. It was conducted between February and June 2022.

### ***Study population and sampling***

The target population of this study includes health professionals from all specialties working in the various departments of the Provincial Hospital Center in Ouarzazate. The exhaustive sampling approach was employed in this study, encompassing all health professionals practicing in every hospital department (nurses, midwives, technicians, and physiotherapists). The total population size included in the study was  $N = 200$ .

For this study's specific aims, we intentionally focused exclusively on healthcare professionals who share a common educational background from the same institute and exhibit similar work patterns and roles (nurses, midwives, technicians, and physiotherapists). This deliberate choice was made to yield more focused and easily interpretable data. As a result, this study includes professionals from all specialties practicing during the data collection period and willingly agreeing to

participate. This study excludes doctors, professionals on leave, health professionals absent during the data collection period, and individuals who declined to participate.

### ***Data collection and instruments***

To collect data for our study, we prepared a questionnaire that covers various sections to gather sociodemographic, socioeconomic, and medical data. A French version of the Nordic questionnaire, consisting of 28 items, was utilized to identify the specific locations of disorders within the last 12 months. The Nordic Musculoskeletal Questionnaire (NMQ) was chosen for its proven validity and reliability in evaluating musculoskeletal symptoms [17,18] and its user-friendly nature for easy administration and completion.

We identified and enlisted participants for our study within the institution through a conventional method involving physically distributing questionnaires using paper and pen. Before commencing the data collection process, we obtained validation from an occupational physician regarding the questionnaire's form and content. This step indicates that we ensured the questionnaire was well-designed and relevant to the specific occupational health context being studied. Furthermore, we conducted a preliminary test involving the distribution of 22 questionnaires to healthcare professionals at a healthcare facility in Ouarzazate. This step ensured the confirmation of question clarity, simplicity, and understanding.

### ***Data analysis***

The data analysis used SPSS version 21 (IBM, Armonk, NY, USA). Variables are expressed as frequencies and percentages. For the association between variables, the chi-square test was applied. The statistical significance level was set at  $P < 0.05$ .

### ***Ethical considerations***

Before initiating the research, the study received approval from the Higher Institute of Nursing Professions and Health Techniques, and administrative permission was obtained from the hospital administration. Before data collection, the following ethical principles were observed and communicated to the participants: (a) providing a clear explanation of the study's objectives to the participating students; (b) ensuring the anonymity of the participants; (c) obtaining their informed consent; and (d) safeguarding the confidentiality of the collected data.

## **RESULTS**

### ***Sociodemographic profile of the study population***

The questionnaire was distributed to 200 healthcare professionals, 120 of whom agreed to participate in the study, giving a response rate of 60%. The target population is characterized by a predominance of females at a rate of 66.7% and a dominance of young age (less than 30 years) at a rate of 51.7%. 41.7% of the population are general nurses, and 66.67% have a 1 to 10-year seniority. The participants work in various departments or units, with the highest representation in the intensive care unit (14.2%). A small percentage of participants have chronic diseases (10.8%), medical history (10.8%), or surgical history (14.2%). In terms of commitment, 30% of participants engage in sports. As for BMI, most of our population had a BMI between 18.5 and 25 (56.7%).

**Table 1 .** Sample characteristics.

	N	Percentage
Sex		
Male	40	33.3%
Female	80	66.7%
Age (years)		
<31 years	62	51.7%
>31 years	58	48.3%

Specialty

General Nurse	50	41.7%
Nurse in Anesthesia and Intensive Care.	11	9.2%
Midwife	16	13.3%
Medical X-ray technician	6	5%
Emergency and intensive care nurse	6	5%
Mental health nurse	11	9.2%
Neonatology and pediatrics nurse	1	0.8%
Laboratory medical analysis technician	3	2.5%
Physiotherapist	16	13.3%
Seniority		
< 10 years	78	65%
> 10 years	42	35

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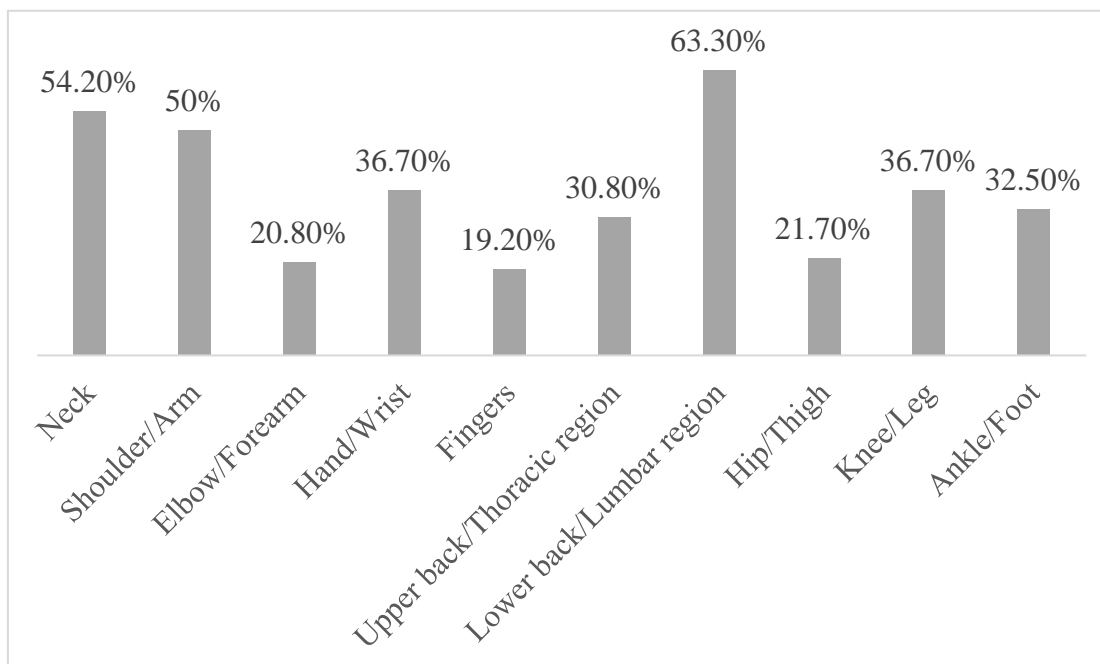
Department/unit

General medicine unit	8	6.7%
General surgery unit	9	7.5%
Intensive care unit	17	14.2%
Emergency	7	5.8%
Psychiatry department	11	9.2%
Postpartum care unit	7	5.8%
Maternity	8	6.7%
Operating room	7	5.8%
Hemodialysis unit	6	5.0%
Pediatric surgery unit	6	5.0%
Pediatric unit	6	5.0%
Center of Blood Transfusion	7	5.8%
Radiology department	7	5.8%
Laboratory	6	5.0%

Rehabilitation unit	8	6.7%
Chronic disease		
Yes	13	10.8%
No	107	89.2%
Medical history		
Yes	13	10.8%
No	107	89.2%
Surgical history		
Yes	17	14.2%
No	103	85.8%
Non-Professional engagements		
Sport	36	30%
Family	14	11.7%
Extra work	7	5.8%
No	63	52.5
Body Mass Index		
Normal	68	56.7%
Non-normal	52	43.3%

### ***Prevalence of MSDs and associated factors***

The general prevalence of musculoskeletal disorders (MSDs) is 89.2%. The lower back is the most frequently experienced site of pain by nursing personnel, accounting for 63.3% over the past 12 months.



**Figure 1.** Locations of musculoskeletal disorders among the participants during the last 12 months.

The prevalence of musculoskeletal disorders is higher in females (95.0%) than in males (77.5%). According to the Chi-square statistical test results, this difference between the two genders is statistically significant ( $p$ -value = 0.009). According to our results, individuals in the age group of less than 31 years have a high prevalence percentage of musculoskeletal disorders (98.4%) with a  $p$ -value > 001, indicating a high statistical significance. There is no observed statistical relationship between an individual's medical and surgical background and the occurrence of musculoskeletal disorders (MSDs).

According to the participants' BMI (Body Mass Index), the prevalence of musculoskeletal disorders revealed that individuals with abnormal BMI (obesity and underweight) have a higher percentage of musculoskeletal disorder prevalence of 94.1%. On the other hand, individuals with an average weight represent a percentage of 80.7%.

It was observed that the prevalence is high among midwives (93.8%), followed by physiotherapists (87.5%) and general nurses with a percentage of 84%. Additionally, the prevalence of musculoskeletal disorders is high among individuals with less than 10 years of experience (96.2%). The Chi-square statistical test analysis demonstrates that the relationship between prevalence and experience is statistically significant ( $p$ -value = 0.001).

When it comes to the working system, health professionals who work in the shift work system are the most affected by musculoskeletal disorders (92%). Moreover, professionals in roles within the general medicine unit, postpartum care unit, laboratory, and radiology unit exhibit the highest prevalence of MSDs (100%). Conversely, professionals in the Pediatric unit experience the lowest prevalence of such disorders (66.7%).

**Table 2.** Self-reported prevalence of MSDs according to the personal characteristics of the participants.

		Prevalence		P value
		N	(%)	
Sex				
	Female	76	95.0%	0.009
	Male	31	77.5%	
Age (year)				
	<31 years	60	96.8%	0.004
	>31 years	46	79.3%	
Medical history				
	Yes	12	92.3%	1
	No	95	88.8%	
Surgical history				
	Yes	16	94.1%	0.6
	No	91	88.3%	
BMI				
	Normal	43	80.7%	0.07
	Non-normal	64	94.1%	

**Table 3.** Self-reported prevalence of MSDs according to the work-related variables of the participants.

		Prevalence		P value
		N	%	
Specialty	General Nurse	42	84%	0.68
	Nurse in Anesthesia and Intensive Care.	11	63.6%	
	Midwife	15	93.8%	
	Medical X-ray technician	6	50%	
	Emergency and intensive care nurse	6	66.7%	
	Mental health nurse	9	81.8%	
	Neonatology and pediatrics nurse	1	0%	
	Laboratory medical analysis technician	3	33.3%	
	Physiotherapist	14	87.5%	
Seniority	<10 years	75	70.09%	0.001
	>10 years	32	29.9%	
Work system	Regular work system	35	87.5%	0.07
	Shift work system	69	92%	
	Rotating work system	3	60%	
Department/unit	General medicine unit	8	100.0%	0.6
	General surgery unit	7	77.8%	
	Intensive care unit	16	94.1%	
	Emergency	6	85.7%	
	Psychiatry department	8	72.7%	
	Postpartum care unit	7	100.0%	
	Maternity	8	100.0%	
	Operating room	6	85.7%	
	Hemodialysis unit	5	83.3%	
	Pediatric surgery unit	5	83.3%	
	Pediatric unit	4	66.7%	
	Center of Blood Transfusion	6	85.7%	
	Radiology department	7	100.0%	
	Laboratory	6	100.0%	
	Rehabilitation unit	7	87.5%	

Musculoskeletal disorders in the lower back are more prevalent among females, accounting for 68.8% compared to 52.5% in males. However, this difference between genders is not statistically significant, as indicated by a p-value of 0.1. Among individuals below the age of 31, 30,71% experience lower back pain, but this disparity in prevalence across age groups is also not statistically significant (p-value = 0.08). On the other hand, there is a significant association between reported low back



pain prevalence and seniority/experience. It is more common among individuals with a seniority/experience of less than 10 years. This difference is statistically significant ( $P = 0.003$ ).

Among various departments, the highest prevalence of lower back pain is observed among professionals working in the maternity department (87.5%), followed by the radiology unit (85.7%) and the Intensive Care Unit (82.4%). However, the difference in prevalence between these departments is not statistically significant, as indicated by a  $p$ -value of 0.7. Additionally, individuals working with a shift work system have a high prevalence of lower back pain, with 68% reporting the condition. However, the association between lower back pain prevalence and shift work system is not statistically significant, with a  $p$ -value of 0.3.

## DISCUSSION

The prevalence of musculoskeletal disorders (MSDs) in the target population over the past 12 months is alarming, as the majority of them (89.2%) are affected, with a high percentage among women (95%). This difference between the two genders is statistically significant ( $p$ -value = 0.009). These findings are consistent with similar studies by Krishnan et al. [19] and Thanh Hai Nguyen [20]. Additionally, most studies indicate that women are significantly more prone to developing MSDs compared to men [19,21].

The lower back is the most commonly affected area (63.3%), followed by the neck with a percentage of 54.20%. These results are consistent with a study conducted in Tunisia, which also found that musculoskeletal problems primarily developed in the lower back (68.5%). They also align with a meta-analysis conducted by Clari et al, involving 3590 nurses [22], where the highest prevalence of musculoskeletal disorders (MSDs) was observed in the lower back (62%; 95% of the sample). Similarly, a study conducted in China found that the most frequently affected areas among nurses were the lower back (73.5%), followed by the neck (73.2%) [4].

Age was a factor influencing the prevalence of Musculoskeletal Disorders (MSDs). Young participants (< 31 years) were the most affected group. This difference in prevalence based on age can possibly be explained, among other factors, by a lack of experience among younger healthcare professionals in the field. On the one hand, younger professionals in the early stages of their careers may still be learning and adapting to the physical demands of their profession. They may also be more prone to additional workload or overtime shifts due to their eagerness to gain experience or prove themselves.

On the other hand, participants who have been working in the field for longer are more likely to have developed better techniques and strategies to minimize the risk of developing MSDs. They may have learned how to position their bodies correctly, use ergonomic equipment, and adopt appropriate work postures that reduce strain on their muscles and joints. However, these findings' potential presence of survival bias should be acknowledged. Healthcare professionals experiencing MSDs may leave their jobs prematurely, especially before reaching an older age. Consequently, the actual risk for older individuals in these findings might be underestimated. Moreover, these findings do not align with those mentioned in other studies that have indicated a higher prevalence of musculoskeletal disorders with increasing age [7,19,21].

The presence of musculoskeletal disorders (MSDs) among the health professionals in our study was significantly associated with years of experience in the profession. According to our results, healthcare professionals with less than 10 years of experience were most susceptible to MSDs ( $p = 0.001$ ). These findings align with a study by Long et al (2021) [23], which reported similar results. Nevertheless, it is essential to acknowledge the potential presence of survival bias in these findings. Suppose individuals at a greater risk of MSDs tend to exit the profession prematurely. In that case, the study's sample may be skewed toward longer-tenured healthcare practitioners who have remained in the field for extended periods. This bias may artificially portray the more experienced group as having a lower MSD risk while potentially underestimating the true risk among less experienced practitioners who may leave due to MSDs or other factors. To address this bias in future research, longitudinal studies tracking individuals from the start of their careers, focusing on reasons for leaving the profession, could provide more accurate insights into the association between experience and MSD risk while accounting

for potential attrition due to health issues. Additionally, conducting subgroup analyses for different healthcare specialties and considering changing workplace conditions over time could further enhance the understanding of this association.

Furthermore, individuals with abnormal body mass index (BMI) had the highest prevalence of musculoskeletal disorders (MSDs) at 94.1%. On the other hand, individuals with normal weight represented the majority, with a prevalence rate of 80.8%. These findings are consistent with existing literature, which indicates that excess weight is recognized as a risk factor for MSDs, particularly in the lower limbs [19]. However, in our study, The association between BMI values and the prevalence of MSDs was not significant ( $p=0.07$ ).

Among the individuals included in the study, midwives exhibited the highest prevalence of musculoskeletal disorders (MSDs) at 93.8%. This was closely followed by physiotherapists, with a prevalence of 87.5%, and general nurses, with a prevalence rate of 84%. Numerous studies have investigated the occurrence of MSDs among midwives and have consistently shown significant prevalence rates [24-26].

We also found that the variables type of work unit, work system, and medical and surgical history did not significantly increase the risk of developing musculoskeletal disorders. However, another study conducted by Bejia et al., 2005 [27], reported a significant relationship between all these factors and the prevalence of MSDs.

The factors associated with the self-reported prevalence of lower back pain, as the most frequently affected region, were examined in our study. The prevalence of lower back pain did not show a significant association with the sex and age of the participants. This result is consistent with a meta-analysis by Clari et al. [22], which demonstrated that gender was not among the significant predictive factors for lower back disorders. Furthermore, our findings revealed a significant association between the number of years of experience and the prevalence of low back pain ( $p=0.003$ ). These findings align with prior studies suggesting that years of professional experience are linked to low back pain [11,28,29].

Regarding the work schedule, 68% of individuals experiencing lower back pain worked in a shift system. However, there was no significant relationship between the work system and the prevalence of low back disorders. The relationship between these variables was statistically significant in a study conducted by Chen et al [30].

Healthcare workers perform many patient-handling tasks throughout their demanding workdays, subjecting them to a significant risk of experiencing widespread lower back discomfort. This prevalent issue arises from the repetitive tasks in patient care, often involving lifting, transferring, and positioning patients. These repetitive movements strain the lower back considerably, increasing the likelihood of discomfort and pain. Furthermore, the abnormal development and activation of the multifidus muscle, a key stabilizing muscle in the lumbar region, can compound the problem. Inadequate activation or muscle imbalances in the multifidus can compromise spinal support, exacerbating the risk of low back pain among healthcare professionals [31].

It is important to acknowledge that there may be variations in findings across studies on musculoskeletal disorders among healthcare workers due to differences in working conditions, workload, and various other factors. The nature of healthcare work is multifaceted, and factors such as patient population, healthcare settings, and individual characteristics can contribute to variations in the prevalence and risk factors of musculoskeletal disorders. Therefore, it is essential to consider the specific context of each study when interpreting and comparing results.

The prevalence of Musculoskeletal Disorders (MSDs) among healthcare workers in Morocco can be interpreted in the context of the challenging healthcare conditions within the country. The healthcare offering encompasses a coherent combination of human resources, healthcare infrastructure, and a material and technical platform to provide care services that meet the population's health needs. However, the shortage of resources in the Moroccan Ministry of Health makes it challenging to maintain the quality of services, leading to suffering among the working population [12]. Despite significant progress in recent years, the Moroccan healthcare system grapples with numerous obstacles. One crucial challenge is the unequal distribution of healthcare resources; this inequality extends to healthcare infrastructure, medical equipment, and specialist care, creating disparities that impact healthcare delivery [32].

Moroccan public hospitals, which shoulder a substantial portion of the healthcare burden, face persistent challenges and dysfunctions. These institutions operate under tremendous pressure due to the rising demand for healthcare services while dealing with a shortage of human resources. The shortage and inefficient management of resources, staff demotivation, deteriorating working conditions, and accessibility difficulties, particularly in remote areas, are some of the dysfunctions plaguing public hospitals in Morocco. The complexity of hospital organization, variability in care processes and flows, diversification of specialties, the complexity of healthcare technologies, and the diversity of cases arriving at the hospital compound the issues these hospitals face [12,33].

The Moroccan province of Ouarzazate, situated in the heart of the Kingdom, is home to 350,000 residents. According to the Moroccan Ministry of Health, it is designated as a region facing challenges regarding the availability of healthcare personnel [34]. In this challenging healthcare environment, healthcare workers in Morocco are more susceptible to MSD due to the physical demands of their profession, the lack of adequate resources, and the strain caused by inadequate working conditions. Understanding the intersection of healthcare conditions and the prevalence of MSDs among healthcare professionals in Morocco is essential for developing targeted interventions and improving the overall quality of healthcare services in the country.

Further research is needed to comprehensively understand the complex interplay between work-related factors, individual factors, and musculoskeletal disorders among healthcare professionals to develop tailored interventions and strategies to promote their well-being and reduce the impact of these disorders on their professional lives. This study is the first of its kind at the provincial and regional level and one of the fewest studies conducted in Morocco among health professionals. The relevance of our study lies in its personal and professional nature, as it explores the issue of musculoskeletal disorders that threaten the quality of care and the personal and professional lives of the professional staff. The tool is primarily based on the Nordic questionnaire, a widely recognized instrument in several international studies. However, this study has several limits that should be considered.

Due to time and accessibility constraints, the study was limited to healthcare staff in two hospital facilities. Achieving a higher level of representativeness would require expanding the study to a regional or national level. The factors associated with the prevalence of MSDs examined in this research were selected based on a recent literature review. However, other cognitive, biomechanical, psychosocial, and organizational factors could have been investigated.

Another limitation of our study is its cross-sectional design, which doesn't allow us to explore cause-and-effect relationships or implement preventive measures for MSDs. Our primary focus is on assessing the prevalence of MSDs.

Moreover, it is essential to acknowledge that excluding professionals on leave from our study population constitutes a limitation. This limitation could impact the comprehensiveness of our findings, as it may not capture the full spectrum of musculoskeletal issues faced by healthcare workers.

Acknowledging these limitations and considering them when interpreting the study findings is important. Future research should address these limitations by including a larger and more diverse sample and exploring additional factors that may contribute to developing MSDs among healthcare professionals.

## CONCLUSIONS

This study investigates the prevalence of musculoskeletal disorders (MSDs) among healthcare practitioners in a Moroccan provincial hospital center, shedding light on critical aspects of this specific healthcare environment. Our findings underscore the substantial burden of MSDs, with an overall prevalence of 89.2%. Lower back pain emerged as the most prevalent issue, affecting 63.3% of respondents over the past year.

The higher prevalence of MSDs among female practitioners (95.0%) compared to their male counterparts (77.5%) reveals a noteworthy gender-based disparity. Additionally, the prevalence of musculoskeletal disorders is high among individuals with less than 10 years of experience (96.2%). Similarly, individuals in the age group of less than 31 years have a high prevalence percentage of musculoskeletal disorders (98.4%).

Evaluating the prevalence of MSDs in the specific healthcare environment studied is pivotal for crafting effective interventions tailored to the needs of local healthcare providers. This study is a cornerstone in this endeavor, significantly assessing MSD prevalence and associated factors.

While our study presents significant insights, it is essential to acknowledge its limitations. Future research should investigate potential cause-and-effect relationships and explore context-specific preventive measures. Doing so can advance the collective effort toward optimizing healthcare professionals' occupational health and well-being.

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